

REMARKS

Summary of the Office Action

In the Office Action dated November 29, 2002, references cited at page 2 (lines 3, 8, 15, and 23), page 3 (line 2), page 4 (line 7), page 5 (lines 2 and 9) and page 23 (lines 5, 7, and 9) were not considered because the listing of references in the specification allegedly is not a proper information disclosure statement. The Abstract stands objected to because it allegedly exceeds the maximum allowed length for an abstract. The specification is objected to because of allegedly unnecessary quotation marks at pages 11 and 14 and because of an alleged incoherent sentence at page 11. Claims 6, 7, 15, and 16 stand rejected under 35 U.S.C. § 112, second paragraph, because the limitation “predetermined value” in claims 6 and 15 respectively, and the limitation “display means” in claims 7 and 16 respectively allegedly lack antecedent bases. Claims 1-4, 6-13, and 15-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,373,533 to Kawabata et al. (hereinafter “Kawabata”) in view of U.S. Patent No. 5,287,418 to Kishida (hereinafter “Kishida”). Claims 5 and 14 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawabata in view of Kishida and in further view of U.S. Patent No. 5,875,262 to Asada (hereinafter “Asada”).

Summary of the Response to the Office Action

In an Information Disclosure Statement and associated PTO Form 1449 filed concurrently herewith, Applicant presents the references cited in the specification in accordance with the requirements of 37 CFR 1.98(b). Applicant has amended claims 6, 7, 15, and 16 to describe the invention differently. Applicant traverses the rejections under 35 U.S.C. § 103(a).

Information Disclosure Statement

References cited at page 2 (lines 3, 8, 15, and 23), page 3 (line 2), page 4 (line 7), page 5 (lines 2 and 9) and page 23 (lines 5, 7, and 9) were not considered because the listing of references in the specification allegedly is not a proper information disclosure statement. In an Information Disclosure Statement and associated PTO Form 1449 filed concurrently herewith, Applicant presents the references cited in the specification in accordance with the requirements of 37 CFR 1.98(b). Accordingly, Applicant respectfully requests that the references listed in the Information Disclosure Statement and PTO Form 1449 be considered by the Examiner.

The Rejections under 35 U.S.C. § 112, second paragraph

Claims 6, 7, 15, and 16 stand rejected under 35 U.S.C. § 112, second paragraph, because the limitation “predetermined value” in claims 6 and 15 respectively, and the limitation “display means” in claims 7 and 16 respectively allegedly lack antecedent bases.

Applicant has amended claims 6, 7, 15, and 16 to describe the invention differently. Applicant respectfully submits that the “predetermined value” limitation recited in claims 6 and 15 is fully supported at least by the recitation at the paragraph beginning at page 32, line 18 of the original specification. The limitation “display means” recited in claims 7 and 16 is fully supported at least by item 3 as depicted in Figures 1 and 10, by step 55 as depicted in Figure 13, and by the recitation at page 36, lines 15-16 of the original specification. The “means for inputting” and “input means” limitations of claims 15 and 16, respectively, are supported at least by the recitation at page 43, lines 7-8 of the original specification.

In view of the foregoing remarks, Applicant respectfully submits that claims 6, 7, 15, and 16, as amended, fully comply with the requirements of 35 U.S.C. § 112, second paragraph. Accordingly, Applicant respectfully requests that the rejections of claims 6, 7, 15, and 16 under 35 U.S.C. §112, second paragraph, be withdrawn.

The Rejections under 35 U.S.C. § 103(a)

Claims 1-4, 6-13, and 15-18 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawabata in view of Kishida. Claims 5 and 14 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kawabata in view of Kishida and in further view of Asada. Applicant traverses these rejections as follows.

Independent claim 1 recites an image processing method of creating a reproduced image by executing image processing on digital image data obtained by a digital camera comprising at least the following steps:

a step of determining at first a density conversion condition for an image expressed by the digital image data; a step of determining next a gradation conversion condition for the image expressed by the digital image data on the basis of the density conversion condition; a step of modifying the digital image data on the basis of at least one of the density conversion condition and the gradation conversion condition.

In the recitation at column 3, lines 1-13 of Kawabata, the histogram generator 1:

outputs a histogram b. The gain controller 2 outputs an adjustment value c for correcting the histogram. The histogram correction circuit (histogram controller) 3 receives the histogram b and the adjustment value c, and outputs a corrected histogram d for intensifying the frequency of a portion of the image containing the picture level required to display a certain feature contained in the image (e.g. a human face). The video signal correction circuit corrects the tone of the input video signals a using the corrected histogram d to produce output video signals e.

Moreover, with regard to Figure 2, Kawabata discloses an average picture level detection circuit 5 that detects the average picture level f of the input video signals and supplies it to the gain controller 2. Based on the value of the average picture level f , the gain controller 2 of Kawabata outputs an adjustment value c for correcting the histogram. The histogram correction circuit 3 corrects the histogram using the adjustment value c and obtains a cumulative normalization function $L2$ using the corrected histogram d (the look-up table LUT representing the cumulative normalization function shown as $L2$; an input/output characteristic used for converting an input video signal or input picture level into an output video signal or output picture level). Finally, the video signal correction circuit 4 corrects the tone of the input video signals using the function $L2$.

In view of the foregoing, Applicant respectfully submits that Kawabata can be characterized as follows: an image is converted with the conversion table obtained from the histogram of the image; the histogram can be corrected for every signal level (every density of the image) using the adjustment value c output by the gain controller; and a portion of specific signal level in the image, such as a human face, can be made brighter.

Thus, Kawabata may be considered to disclose that the adjustment value c used for correcting an LUT representing an input/output characteristic is found in accordance with the average picture level f of the input video signals, and the input/output characteristic (LUT) is obtained on the basis of the adjustment value c thus found.

Accordingly, the adjustment value c of Kawabata is not used for correcting the densities of the input video signals but first and foremost for the correction of the histogram. On the other hand, the density conversion condition of the present invention is used for correcting the densities of the input image data so as to obtain corrected image data. Moreover, the gradation

correction of the instant invention is performed on the basis of the result of the density correction. Accordingly, there is a causal relation between the gradation correction and the density correction in that the former is dependent on the results of the latter.

Accordingly, Applicant respectfully submits that Kawabata does not teach or disclose the gradation conversion condition of the present invention as recited in claim 1. Moreover, Applicant submits that Kawabata, as recited above, does not teach or suggest at least the steps of “determining [next] a gradation conversion condition for the image expressed by the digital image data on the basis of the density conversion condition.” Applicant further submits that Kishida fails to cure these deficiencies of Kawabata. Accordingly, Applicant respectfully submits that independent claim 1 is patentable over Kawabata in view of Kishida. Applicant respectfully requests that the rejection of independent claim 1 under 35 U.S.C. § 103(a) be withdrawn.

Independent claim 2 recites an image processing method of creating a reproduced image by executing image processing on digital image data obtained by a digital camera comprising at least the following steps:

a step of determining a density conversion condition for converting a density of the density component data, and determining a gradation conversion condition for converting a gradation of the digital image data on the basis of the density conversion condition; a step of modifying the density component data in accordance with the density conversion condition and the gradation conversion condition.

In light of the arguments presented above for independent claim 1, Applicant submits that Kawabata does not teach or suggest at least the step of “determining a density conversion condition for converting a density of the density component data, and determining a gradation conversion condition for converting a gradation of the digital image data on the basis of the

density conversion condition” as recited in claim 2. Applicant further submits that Kishida fails to cure at least this deficiency of Kawabata. Accordingly, Applicant respectfully submits that independent claim 2 is patentable over Kawabata in view of Kishida. Applicant respectfully requests that the rejection of independent claim 2 under 35 U.S.C. § 103(a) be withdrawn.

Furthermore, Applicant respectfully submits that **dependent claims 3-9** should be allowed at least because of their respective dependence upon allowable claims 1 and 2. Accordingly Applicant respectfully requests that the rejections of dependent claims 3-9 under 35 U.S.C. 103(a) be withdrawn.

Independent claim 10 recites an image processing apparatus for creating a reproduced image by executing image processing on digital image data obtained by a digital camera comprising a density conversion condition determining means, a gradation conversion condition determining means, and an image data converting means in an arrangement where the gradation conversion condition determining means determines “a gradation conversion condition for the image expressed by the digital image data on the basis of the density conversion condition,” and the image data converting means creates “the reproduced image by modifying the digital image data on the basis of at least one of the density conversion condition and the gradation conversion condition.”

In light of the arguments presented above for independent claim 1, Applicant respectfully submits that Kawabata does not teach or suggest at least the features of claim 10 recited above. Applicant further submits that Kishida fails to cure at least these deficiencies of Kawabata. Accordingly, Applicant respectfully submits that independent claim 10 is patentable over Kawabata in view of Kishida. Applicant respectfully requests that the rejection of independent claim 10 under 35 U.S.C. § 103(a) be withdrawn.

Independent claim 11 recites an image processing apparatus for creating a reproduced image by executing image processing on digital image data obtained by a digital camera comprising at least a density conversion condition determining means, a gradation conversion condition determining means, and a data converting means in an arrangement where the density conversion condition determining means determines “a density conversion condition for converting a density of the density component data,” the gradation conversion condition determining means determines “a gradation conversion condition for converting a gradation of the digital image data on the basis of the density conversion condition,” and the data converting means modifies a density component data “in accordance with the density conversion condition and the gradation conversion condition.”

In light of the arguments presented above for independent claim 1, Applicant respectfully submits that Kawabata does not teach or suggest at least the features of claim 11 recited above. Applicant further submits that Kishida fails to cure at least these deficiencies of Kawabata. Accordingly, Applicant respectfully submits that independent claim 11 is patentable over Kawabata in view of Kishida. Applicant respectfully requests that the rejection of independent claim 11 under 35 U.S.C. § 103(a) be withdrawn.

Furthermore, Applicant respectfully submits that **dependent claims 12-14** should be allowed at least because of their respective dependence upon allowable claims 10 and 11. Accordingly Applicant respectfully requests that the rejections of dependent claims 12-14 under 35 U.S.C. 103(a) be withdrawn.

Conclusion

In view of the foregoing, Applicant respectfully requests reconsideration and reexamination of this application, withdrawal of all rejections and objections, and the timely allowance of all pending claims. Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact Applicant's undersigned representative to expedite prosecution.

Attached hereto is a marked-up version of the changes made by the current amendment. The attachment is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE.**"

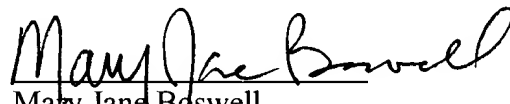
If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 50-0310. If a fee is required for an extension of time under 37 C.R.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

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Dated: February 27, 2003

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT:

The abstract has been amended as follows:

-- [The]An image processing method [of the invention creates] for creating a reproduced image by executing image processing on digital image data obtained by a digital camera. This method[, first,] determines first a density conversion condition for [an image expressed by] the digital image [data], [next,] determines next a gradation conversion condition for the image on the basis of the density conversion condition, modifies the digital image [data] on the basis of at least one of the density and the gradation conversion conditions, and thus creates the reproduced image. The method may initially separate [previously] the digital image data into density component data and color component data, determine the density and gradation conversion conditions by using the density component data instead of the digital image data, modify the density component data in accordance with the density and gradation conversion conditions and synthesize the modified density component data with the color component data. [The image processing apparatus performs the method described above. These method and apparatus are capable of obtaining a high-quality image by automatically or manually modifying a density of digital image data acquired by a digital camera, and also the density from digital image data of which a principal image area does not have a proper value as well as from image data of digital cameras with different exposures when photographing.]--

IN THE SPECIFICATION:

The specification has been amended as follows:

The paragraph beginning at page 11, line 11, has been replaced with the following paragraph:

-- Further, [“]the representative value representing the principal image area[”] implies a value (image data, and a density value, etc.) with which the principal image area is directly or indirectly or statistically estimated based on the characteristic value given above. The reason why [“]the representative value [is reference”] is derived [from] in such a manner is [an intention that “there is eliminated] to eliminate an influence upon the converted representative value [converted based on the relationship] due to an interaction between the modified image data and the digital image data[”].--

The paragraph beginning at page 14, line 15 has been replaced with the following paragraph:

-- Herein, [“]the processed image data is modified based on the reproducing aim value of the reproducing apparatus[”], which implies that the reference value of the digital image data can be reproduced properly by the reproducing apparatus. For example, it means that if respective RGB signal values take 255, 255, 255 (in the case of 8 bits) as the reference value, the reproducing aim value is white, and the modification is made so that the reference value turns out to be white.--

IN THE CLAIMS:

Claims 6-7 and 15-16 have been amended as follows:

6. (Amended) [An]The image processing method according to claim 1 or 2, further comprising the step of inputting a predetermined value, and wherein the gradation conversion

condition is so determined as to harden and soften a tone of the image expressed by the digital image data [on the basis of a] based on the predetermined value.

7. (Amended) [An]The image processing method according to claim 1 or 2, further comprising the steps of displaying the image expressed by the digital image data on a display means and inputting an instruction from outside based on the displayed image, and wherein the density conversion condition is[, when the image expressed by the digital image data is displayed on display means,] determined by [an] the instruction inputted from outside [on the basis of] based on the displayed image.

15. (Amended) [An]The image processing [method] apparatus according to claim 10 or 11, further provided with means for inputting a predetermined value, and wherein the gradation conversion condition is so determined as to harden and soften a tone of the image expressed by the digital image data [on the basis of a] based on the predetermined value.

16. (Amended) [An]The image processing apparatus according to claim 10 or 11, further comprising a display means for displaying the image expressed by the digital image data, and input means for inputting an instruction from outside based on the displayed image, and wherein said density conversion condition determining means determines[, when the image expressed by the digital image data is displayed on display means,] the density conversion condition by [an] the instruction inputted from outside on the basis of the displayed image.